

IN THE CLAIMS:

1. (Currently Amended) A method for producing an electron-emitting device, comprising the steps of:

(A) disposing a cathode electrode having a plurality of fibers on a surface of a substrate;

(B) providing an electrode opposite the cathode electrode; and

(C) ~~disposing plural pieces of fiber containing carbon on the cathode electrode; and~~

(D) applying a potential higher than a potential applied to the cathode electrode under a depressurized condition to an electrode opposite the cathode electrode;

wherein each fiber comprises a plurality of graphenes stacked in a direction that is not perpendicular to an axis direction of each fiber.

2. (Original) The method for producing an electron-emitting device, according to claim 1, wherein

said electrode opposite the cathode electrode is an anode electrode provided apart the substrate.

3. (Currently Amended) The method for producing an electron-emitting device, according to claim 1, wherein

said electrode opposite the cathode electrode is an ~~extracting~~
extraction electrode for extracting electrons from at least one of the plurality of fibers,
provided apart from the cathode electrode on the surface of the substrate.

4. (Currently Amended) The method for producing an electron-emitting
device, according to claim 1, wherein

said step of applying the potential to the electrode opposite the
cathode electrode is a step of increasing ~~[[the]]~~ a number of emission sites.

5. (Currently Amended) The method for producing an electron-emitting
device, according to claim 1, wherein

said potential applied to the electrode opposite the cathode electrode
is a potential at which an electron is emitted from at least one ~~fiber~~ of ~~[[a]]~~ the plurality of
fibers ~~containing carbon as a main component~~.

6. (Currently Amended) The method for producing an electron-emitting
device, according to claim 1, wherein

said step of applying the potential to the electrode opposite the
cathode electrode is performed under a condition of a gas chemically or physically reactive
to the ~~[[plural pieces]]~~ plurality of fibers.

7. (Currently Amended) The method for producing an electron-emitting device, according to claim 6, wherein

said gas chemically reactive to the [[plural pieces]] plurality of fibers is one of O₂, H₂, CO₂, and H₂O.

8. (Original) The method for producing an electron-emitting device, according to claim 6, wherein

a pressure for introducing the gas is equal to or over 1×10^{-4} Pa.

9. (Original) The method for producing an electron-emitting device, according to claim 6, wherein

said step of applying the potential to the electrode opposite the cathode electrode is a step of applying a pulse voltage between the cathode electrode and the electrode opposite the cathode electrode.

10. (Currently Amended) The method for producing an electron-emitting device, according to claim 1, wherein

[[said plural pieces]] the plurality of fibers are formed by decomposing a ~~hydrogen carbide~~ hydrocarbon gas.

11. (Currently Amended) The method for producing an electron-emitting device, according to claim 10, wherein

[[said plural pieces]] the plurality of fibers are formed by decomposing the ~~hydrogen-carbide~~ hydrocarbon gas using a catalyst provided on the cathode electrode in advance.

12. (Original) The method for producing an electron-emitting device, according to claim 11, wherein

said catalyst is one of Fe, Co, Pd, and Ni, or an alloy consisting of materials selected from among Fe, Co, Pd, and Ni.

13. - 16. (Cancelled)

17. (Currently Amended) A method for producing an electron source obtained by arranging a plurality of electron-emitting devices, which are each produced according to the method of any one of claims 1 to ~~16~~ 12.

18. (Previously Presented) A method for producing an image-forming apparatus having an electron source and an image-forming member, wherein

said electron source is produced according to the method of claim 17.

19. (Previously Presented) A method for producing an electron source having a plurality of electron-emitting devices, comprising the steps of:

(A) providing on a substrate a plurality of electron-emitting devices comprising plural pieces of fiber containing carbon, and plural pieces of wiring electrically connected to at least one of the plurality of electron-emitting devices;

(B) measuring by applying a voltage to at least a part of the plurality of electron-emitting devices, an electrical characteristic of said at least a part of the plurality of electron-emitting devices to which the voltage is applied;

(C) reducing a difference in electrical characteristic among the plurality of electron-emitting devices based on a measurement result, wherein

said step of reducing the difference in characteristic among the plurality of electron-emitting devices comprising a step of emitting an electron from at least one of the plurality of electron-emitting devices under depressurized condition.

20. (Previously Presented) The method for producing an electron source, according to claim 19, wherein

said plural pieces of wiring comprise plural pieces of row direction wirings, and plural pieces of column direction wirings crossing the row direction wirings, and each of the electron-emitting devices is connected to one of the row direction wirings and one of the column direction wirings.

21. (Currently Amended) The method for producing an electron source, according to claim 20, wherein

said step of reducing the difference in characteristic among the plurality of electron-emitting devices contains a step of emitting an electron from a desired electron-emitting device by repeating a step of selecting from said plural pieces of column direction wirings or said plural ~~[[piece]]~~ pieces of row direction wirings, a part of the pieces of column direction wirings or row direction wirings, and emitting an electron from an electron-emitting device connected to the selected wiring.

22. (Original) The method for producing an electron source, according to claim 19, wherein

said step of reducing the difference in characteristic among the plurality of electron-emitting devices contains a step of emitting an electron from a desired electron-emitting device by repeating a step of selecting a part of electron-emitting devices from among the plurality of electron-emitting devices and emitting an electron from the selected electron-emitting device.

23. (Currently Amended) The method for producing an electron source, according to claim 19, wherein:

said electron-emitting device contains a cathode electrode to which the fiber is electrically connected, and ~~a leading electrode~~ an extracting electrode provided apart from the cathode electrode; and

said step of emitting an electron from the at least one electron-emitting device is performed by applying a voltage between the cathode electrode and the extracting electrode.

24. (Currently Amended) The method for producing an electron source, according to claim 19, wherein

said step of emitting an electron from the at least one electron-emitting device is performed by applying a voltage between ~~[[the]]~~ an electrode provided apart from the substrate and the electron-emitting device.

25. (Currently Amended) The method for producing an electron source, according to claim 19, wherein~~[[:]]~~

said electron-emitting device contains a cathode electrode to which the fiber is electrically connected, and an extracting electrode provided apart from the cathode electrode; and

said step of emitting an electron from the at least one electron-emitting device is performed by applying a potential difference between an electrode provided apart from the substrate and the electron-emitting device.

26. (Currently Amended) The method for producing an electron source, according to claim 19, wherein

said step of reducing the difference in characteristic among the plurality of electron-emitting devices is a step of increasing [[the]] a number of emission sites of at least one electron-emitting device.

27. (Original) The method for producing an electron source, according to claim 19, wherein

said step of reducing the difference in characteristic among the plurality of electron-emitting devices is performed in ambient of a gas chemically or physically reactive to the fiber.

28. (Original) The method for producing an electron source, according to claim 27, wherein

said gas chemically reactive to the fiber contains a gas selected at least from among O₂, H₂, CO₂, and H₂O.

29. (Original) The method for producing an electron source, according to claim 28, wherein

a pressure for introducing the gas is equal to or over 1×10^{-4} Pa.

30. (Currently Amended) The method for producing an electron source, according to claim 27, wherein

said step of emitting an electron from at least one of the plurality of ~~[[the]]~~ electron-emitting devices is performed by applying a pulse voltage to the at least one electron-emitting device.

31. (Currently Amended) The method for producing an electron source, according to claim 19, wherein

said plural pieces of fiber ~~[[is]]~~ are formed by decomposing a ~~hydrogen-carbide~~ hydrocarbon gas.

32. (Currently Amended) The method for producing an ~~electron-emitting device~~ electron source, according to claim ~~[[31]]~~ 19, wherein

said plural pieces of fiber ~~[[is]]~~ are formed by decomposing the ~~hydrogen-carbide~~ hydrocarbon gas using a catalyst provided on the cathode electrode in advance.

33. (Currently Amended) The method for producing an ~~electron-emitting device~~ electron source, according to claim 32, wherein

said catalyst is one of Fe, Co, Pd, and Ni, or an alloy consisting of materials selected from among Fe, Co, Pd, and Ni.

34. (Currently Amended) The method for producing an ~~electron-emitting device~~ electron source, according to claim 19, wherein

said fiber is formed by graphite nanofiber, carbon nanotube, or amorphous carbon fiber.

35. (Currently Amended) The method for producing an ~~electron-emitting device~~ electron source, according to claim 19, wherein

said fiber comprises a ~~[[graphen]]~~ graphene.

36. (Currently Amended) The method for producing an ~~electron-emitting device~~ electron source, according to claim 19, wherein

said fiber comprises a plurality of ~~[[graphens]]~~ graphenes.

37. (Currently Amended) ~~An electron-emitting device~~ The method for producing an electron source, according to claim 36, wherein

said plurality of ~~[[graphens]]~~ graphenes are ~~layered~~ stacked in an ~~axial direction of the fiber containing carbon~~ a direction that is not perpendicular to an axis direction of each fiber.

38. (Currently Amended) A method for producing an image-forming apparatus having an electron source and an ~~electron-emitting~~ image-forming member, wherein

said electron source is produced according to the method of any one of claims 19 to 37.

39. (Currently Amended) The method for producing an image-forming apparatus, according to claim 38, wherein

said image-forming apparatus is obtained by seal bonding a first substrate provided with the image-forming member with a second substrate provided with the electron source, and an electrical characteristic of at least one of the electron-emitting devices is measured before the first and second substrates are seal bonded with each other.

40. (Original) The method for producing an image-forming apparatus, according to claim 38, wherein

said image-forming apparatus is obtained by seal bonding a first substrate provided with the image-forming member with a second substrate provided with the electron source, and said step of reducing the difference in electrical characteristic among the plurality of electron-emitting devices is performed before the first and second substrates are seal bonded with each other.

41. (Currently Amended) A method for producing an electron-emitting device according to Claim 5, wherein said step of applying the potential to the electrode opposite the cathode electrode includes a process of removing a part of the at least one fiber using heat due to electron emitting from the at least one fiber among the plurality of fibers ~~containing carbon as a main component~~.

42. - 44. (Cancelled)

45. (New) A method for producing an electron-emitting device, comprising the steps of:

- (A) disposing a cathode electrode having a plurality of fibers, on a surface of a substrate;
- (B) providing an electrode opposite the cathode electrode; and
- (C) applying a potential higher than a potential applied to the cathode electrode under a depressurized condition to the electrode opposite the cathode electrode, wherein said step of applying the potential to the electrode opposite the cathode electrode is a step of increasing a number of emission sites.

46. (New) A method for producing an electron source having a plurality of electron-emitting devices, comprising the steps of:

providing on a substrate a plurality of electron-emitting devices comprising plurality pieces of fiber; and

reducing a difference in electron emission characteristics among the plurality of electron-emitting devices,

wherein said step of reducing comprises a step of emitting electrons from at least one of the plurality of electron-emitting devices under a depressurized condition, and

wherein each fiber comprises a plurality of graphenes stacked in a direction that is not perpendicular to an axis direction of each fiber.

47. (New) A method for producing an electron source having a plurality of electron-emitting devices, comprising the steps of:

providing on a substrate a plurality of electron-emitting devices comprising plural pieces of fiber;

identifying at least one lowest electron-emitting device having a lowest electron emission threshold voltage among the plurality of electron-emitting devices; and

shifting each electron emission threshold voltage of electron-emitting devices other than the at least one lowest electron-emitting device, so as to become closer to the lowest electron emission threshold voltage, by performing an electron emission from the electron-emitting devices other than the at least one lowest electron-emitting device, under a depressurized condition.

48. (New) The method of producing an electron source, according to claim 47, wherein each fiber comprises a plurality of graphenes stacked in a direction that is not perpendicular to an axis direction of each fiber.

49. (New) A method for producing an electron-emitting device, comprising the steps of:

(A) disposing a cathode electrode having a plurality of fibers on a surface of a substrate;

(B) providing an electrode opposite the cathode electrode; and

(C) applying a potential higher than a potential applied to the cathode electrode under a depressurized condition to an electrode opposite the cathode electrode,

wherein each fiber comprises a plurality of graphenes which are stacked so as not to be parallel to an axis direction of each fiber.